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Subject: Woodside Avenue Extended Detention Basin
Technical Approach Summary

This document provides a summary of the technical approach and equipment utilized to assess the Woodside Avenue Extended Detention Basin (basin). More detailed technical information is available in the Quality Assurance Project Plan (QAPP) and the Sampling and Analysis Plan (SAP) which are on file with the County of San Diego.

Weston Solutions, Inc. (Weston) initiated work on the Woodside Avenue Extended Detention Basin Best Management Practice (BMP) Assessment in December 2004 and is currently completing the final report for this assessment. The following sections provide a summary of work completed during this period.

Assessment Strategy
This assessment consisted of three components. The first was water quality which was monitored during both storm and dry weather events throughout this project. The second was bioassessment which was monitored prior to construction and after full vegetative establishment. The third was a vegetation survey completed following full vegetative establishment within the basin. Additionally, photo documentation was conducted throughout the project.

Vegetation Survey
A vegetation survey was conducted following full establishment of vegetation. The vegetation survey broadly classified plants into terrestrial grasses, terrestrial mixed, emergent, and aquatic communities and a map is being produced displaying where these plant communities have established themselves within the basin. The purpose of the vegetation survey was to assess the success of revegetation efforts within the basin following construction.

Bioassessment
Bioassessment was conducted prior to construction and following full vegetative establishment to assess the change in water quality provided by the basin. Bioassessment utilizes aquatic organisms to assess the overall water quality. There were two bioassessment locations selected for this project, one at the inlet, and one at the outlet of the basin.

Storm and Dry Weather Water Quality Monitoring
Water quality was assessed through collection of flow weighted composite samples during storm and dry weather events. Samples collected were used to assess the function of the basin by measuring the total reduction in pollutant load of runoff waters that passed through the basin.

Water Quality Sampling Locations
Sample locations were chosen to provide flow and analytical chemistry data for all runoff water entering and exiting the basin.

There are three paths for water to exit the basin:

- a 12 inch effluent orifice which is the primary effluent device,
- a large spillway designed to prevent upstream flooding if water levels rise above it, and
- an 18 inch emergency bypass that is for use only if the primary effluent orifice becomes clogged and it is necessary to drain the basin.

Flow monitoring and sampling equipment was installed in the 12 inch primary effluent device. Flow was not monitored nor were samples collected for either the emergency bypass or the spillway.

There are two major influent conveyances into the basin: an 18 foot rectangular concrete channel and a 36 inch corrugated plastic pipe. Within both of the inlets there are two (one in each inlet) additional small inlets downstream of sampling and monitoring equipment. It was not possible to install sampling and monitoring equipment downstream of these two small inlets, thus flow and analytical chemistry analysis does not include input from these inlets. These small inlets were determined using best professional judgment to be insignificant contributors to the overall influent flow and water quality of the basin.

Water Quality Sampling Equipment

Flow-weighted composite samples were collected utilizing American Sigma 900MAX peristaltic samplers and American Sigma 950 OptiFlow flow meters. American Sigma tipping bucket rain gauges were utilized to measure rainfall and all equipment and data was remotely operated and monitored utilizing American Sigma 1000 cellular modems. Twelve-volt deep cycle marine batteries were used as the power source. All equipment was stored inside Knaack chests model KN4830 which were anchored to concrete pads to prevent theft and deter vandalism.

Storm Event Sampling

Weather is closely monitored during the storm season utilizing National Weather Service (NWS) weather forecasts, radar, and satellite imagery. A storm is considered viable for monitoring if it is forecast to produce at least 0.10 inches of rainfall. Rainfall amount, intensity, and duration must all be carefully weighed when making a decision to monitor a storm.

When it is decided that a storm will be monitored several factors are looked at to determine the proper “pacing” for collecting flow weighted samples. Rainfall amount, intensity and duration are once again taken into consideration along with the current stage and flow in the channel, amount of time since the last rain event and moisture level of soils in the surrounding area. Utilizing all of these factors a “pacing” can be chosen and set into the flow meter (e.g. a pacing of 10,000 cubic feet means that one sample will be collected for every 10,000 cubic feet of water that pass by the sample point).

Once a pacing interval is chosen it is then remotely programmed into the flow meter. The pacing is enabled at the onset of rainfall or with an increase in water level within the channel so that base flows are not sampled. Field teams are then dispatched to the site to ensure samples are being collected and equipment is functioning properly. Field crews also document basin

conditions and collect physical water quality parameters. Provided sampling stations are performing properly, field crews leave the site, and the sampling stations are monitored remotely.

The progress of storms is monitored by radar, satellite, and a combination of NWS and private rain gauges. Based on observed and predicted rainfall and intensity and duration of rainfall, adjustments to sampling are made remotely, as necessary, during the storm.

The goal of sampling was to capture an entire storm, thus the influent sampling locations may only be sampled for a few hours, while the effluent sampling location would undergo sampling for up to three days however all storms sampled during this assessment overtopped the spillway. Once the spillway was overtopped the basin was considered to no longer be functioning as designed and sampling was ceased at all locations. Once the spillway was overtopped, flow data showed that untreated water back-flowed into the effluent orifice and would have been sampled as treated water. All storm events monitored were considered complete and the sampling event terminated due to spillway overtopping. A total of six storm events were sampled during this assessment.

Dry Weather Event Sampling

Dry weather sampling events were conducted by first determining the proper pacing for base flow conditions. This was accomplished by monitoring dry weather flows for 24 hours prior to sampling. Then, based on those flows, samplers were enabled and sampling was conducted for a period of 24 hours. A total of five dry weather events were sampled during this assessment.